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Isolated Tuberculosis of the Popliteal Cyst

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Summary

We encountered a case of tuberculosis of a popliteal cyst in a 76-year-old man. He visited our department for treatment of the left knee pain which had not responded to treatment over the previous ten months. At first examination, local rubor, swelling and tenderness on a popliteal cyst were noted. Therefore, curettage of the lesion, including resection of the cyst, was performed. Six weeks later, an abscess had formed in the subcutaneous area over the lateral aspect of the knee, which was cleaned out. The abscess recurred in the same area four months later. At the third operation, curettage of the abscess together with a knee joint synovectomy was performed. Upon pathologic examination, a tuberculous lesion of the popliteal cyst and skin were recognised. However, no tuberculous lesion was detected in the synovia of the knee joint.

It is generally agreed that it is possible for a popliteal cyst to be infected from synovial tuberculosis of the knee joint. However, in our case, based on the histopathological and clinical observations, the primary tuberculous lesion appeared to have been in the popliteal cyst, which is very rare indeed.

Recent developments in preventative medicine and chemotherapy have markedly reduced the incidence of tuberculous arthritis. However tuberculous arthritis is still an important disease in the differential diagnostic of persistant monoarthritis of the knee.

Approximately half of the popliteal cyst communicate with the knee joint. However, it is not frequent for tuberculosis to propagate from the knee joint into the popliteal cyst. Moreover, to our knowledge, the isolated presentation of tuberculosis in the popliteal cyst without tuberculous manifestation of the knee joint, as reported in this paper, appears to be the first case of its kind. We hereby report our experience of treating a patient with isolated tuberculosis of a popliteal cyst.

Case Report

A 76-year-old male patient visited our department in October 1985 for treatment of pain in the left knee joint. He complained of moderate pain, swelling and a local burning sensation extending

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from the left knee joint down to the calf. Under his previous doctor, he had received lumbar traction and electric treatment for about ten months, which did not reduce the pain. Even though the pain had never become severe, it was chronic. Beginning one month before our initial examination, he began to experience difficulty in walking due to an increase in pain. His family history as well as his own past medical history revealed no incidence of tuberculosis.

Findings at initial examination:

The left lower extremity exhibited external rotation due to a malunion of an old trochanteric fracture. There was swelling, flexion contracture of the left knee and the patella was ballotable. An egg-sized popliteal cyst was detected. Slight redness, a local burning sensation and tenderness were noted over the popliteal cyst and the posterolateral aspect of the knee.

The range of motion of the joint was from 20° to 110°

Aspiration of the knee joint yielded 15 ml of slightly turbid fluid. When the cyst was aspirated, only 3 ml of fluid could be withdrawn as much debris appeared to block the puncture needle so that complete drainage could not be performed.

Laboratory analysis:

The erythrocyte sedimentation rate was 33/(1°) while other blood cell counts were normal. Although the level of gamma globulin had increased to 24.3%, the biochemical values were not abnormal (Table I). A serum Wassermann reaction as well as the TPHA were positive. Synovial fluid obtained from the joint aspiration and the fluid from the popliteal cyst were tested for bacteria.

Table 1. Labolatory examination

〈Blood〉		〈Biochemistry〉	
RBC	4.08 $\times 10^6$	GOT	20 U/ℓ
Hgb	13.1 g/dℓ	GPT	6 U/ℓ
Ht	39.1 %	Al-P	5.3 KA-U
PLT	203 $\times 10^3$	Ch-E	0.63 ΔpH
WBC	5000	LDH	68 U/ℓ
St	10 %	γ-GTP	28 U/ℓ
Seg	61 %	Triglyceride	87 mg/dℓ
Eosino	2 %	T-Cholesterol	154 mg/dℓ
Baso	1 %	β-Lipoprotein	239 mg/dℓ
Lymph	18 %	Phospholipid	155 mg/dℓ
Mono	8 %	BUN	21.1 mg/dℓ
E.S.R.	33 /1°	Uric Acid	5.4 mg/dℓ
〈Urine〉		Creatinine	1.15 mg/dℓ
Protein	5 mg/dℓ	FBS	mg/dℓ
Sugar	0.03 g/dℓ	Na	136.4 mEq/ℓ
Urobilinogen	0.3 mg/dℓ	K	4.6 mEq/ℓ
Bilirubin	0.29 mg/dℓ	Cl	101.5 mEq/ℓ
Ketone	2 mg/dℓ	T-Protein	7.0 g/dℓ
Occult Blood	0.02 mg/dℓ	Alb	55.4 %
pH	5.7	α_1-G	2.9 %
Wa氏	(+)	α_2-G	7.1 %
TPHA	(+)	β-G	10.2 %
PPD	12 x 9 mm	γ-G	24.3 %

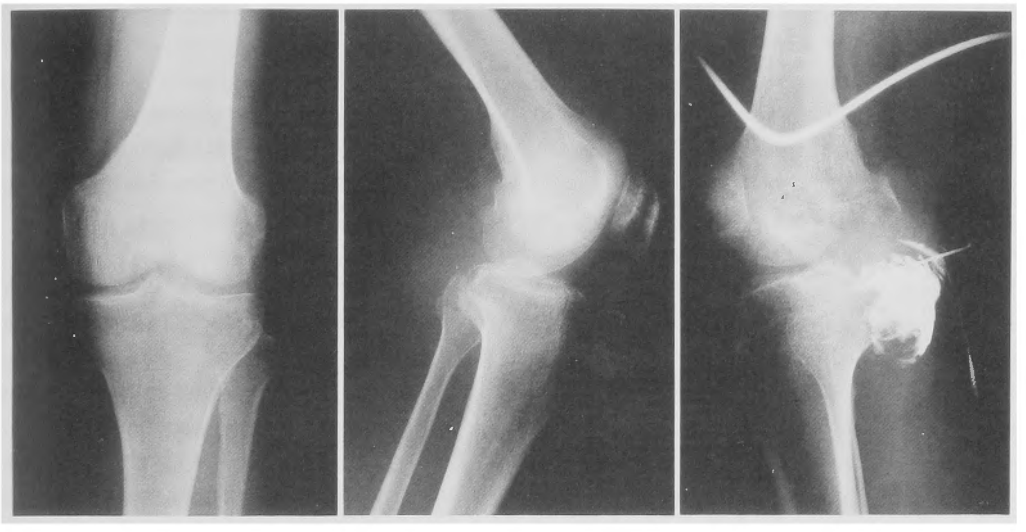

Fig. 1. X-ray picture

a, b. X-ray pictures of the left knee joint at the first examination showed slight bone atrophy.

c. Contrast picture of the popliteal cyst revealed no communication with the joint cavity.

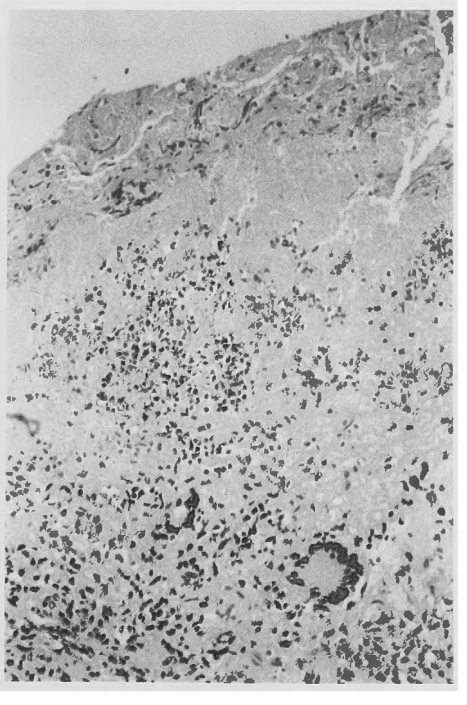

Fig. 2. Histological picture of the skin lesion

Histological examination revealed caseous necrosis with edematous granulation tissue and epithelioid and Langhans giant cells, which was diagnosed with skin tuberculosis.

General bacteria, acid-fast bacteria and fungi cultures were all negative. The size of the reaction to a PPD was 12 mm × 9 mm.

X ray examination:

Although slight bone atrophy was noted in the condyles of the femur and tibia, irregularities in bone outline or narrowing of the joint sapce were not detected (Fig. 1-a, b). A contrast popliteal cystogram revealed no communication with the joint space (Fig. 1-c). There was no abnormal shadow suggestive of tuberculosis on the chest X ray.

Findings at surgery and the clinical course:

In consideration of the above findings, the patient was diagnosed as having a mild toxic bacterial infection, and so on October 15, 1985, curettage of the lesion including cystectomy was performed. The cyst was filled with a synovial fluid-like liquid with numerous rice bodies. In addition, and increase in synovial villi growth was seen. Adhesions between the cyst and the surrounding tissues were dense, and the inflammation had spread to the periphery along the fascia of gastrocnemius. An inflamed posterior knee joint capsule also was curettaged. The joint was not openned anteriorly, however, tubing was left inside the joint space and continuous joint perfusion was maintained for 2 weeks. Pathological examination of the cyst revealed nonspecific inflammation, so systemic and continuous local infusion of antibiotics were used to treat the infection. However, these pathological findings were later revised. Although the antibiotics relieved the symptoms to a certain extent, the erythrocyte sedimentation rate continued to increase.

On December 4, 1985, swelling and redness were developed over the side of the left knee. Pus

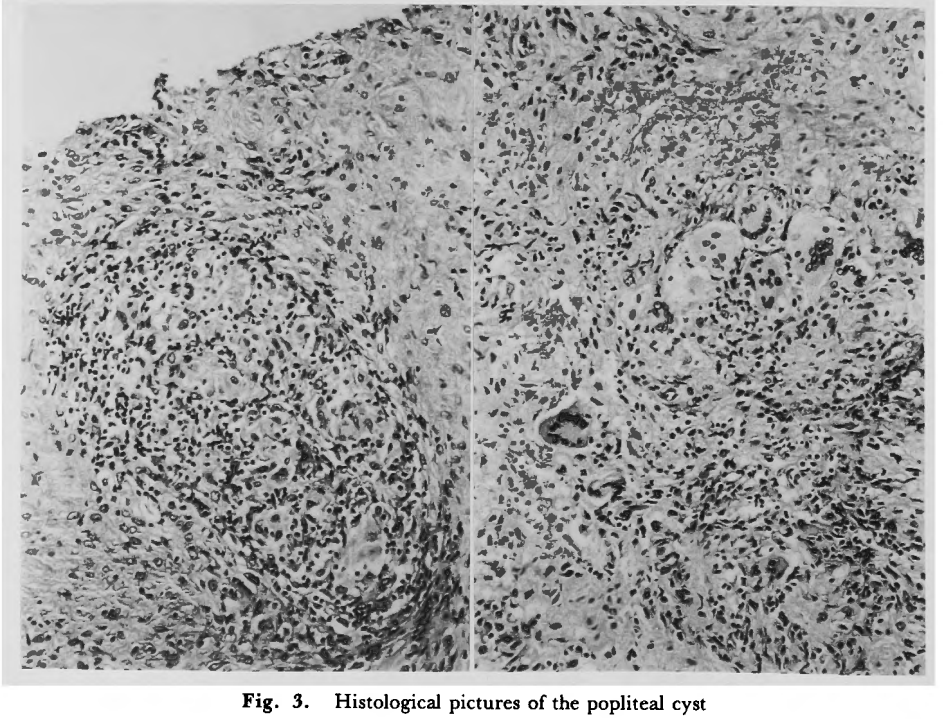

Fig. 3. Histological pictures of the popliteal cyst

a, b. Histological examination of the popliteal cyst revealed tuberculous granuloses which included epithelioid nodi and Langhans giant cells.

was collected by aspiration and acid-fast bacteria were identified by Ziel-Neelsen stain. Immediately, treatment with anti-tuberculosis agents such as SM, INAH, EB and RFP was begun, and the lesion was cleaned. The lesion was limited to the subcutaneous area and did not connect with the joint space, the popliteal cyst or the fascia. Histopathological examination revealed caseous necrosis with edematous granulation tissues, epithelioid reaction and Langhans giant cells. It was a typical histology of skin tuberculosis (Fig. 2).

At this point, the histopathological findings of the popliteal cyst were reevaluated. Since tuberculous granulomas which included epithelioid nodules and Langhans giant cells were identified, tuberculosis of the popliteal cyst was diagnosed (Fig. 3-a, b). After incubation, acid-fast bacteria were identified as human type tubercle bacillus. However, due to a drug reaction, treatment with anti-tuberculosis drugs was temporarily suspended and beginning December 21, reduced dosages of INAH 0.4, EB 0.5 and RFP 300 mg were administered.

Thereafter, progress was excellent, and the patient was discharged on January 23, 1986. He remained on the antituberculosis drug therapy, but he seems not to have taken it regulary. However, on March 31, 1986, he complained again of swelling and redness of his knee at the site of the previous curettage. Repeat curettage was performed on April 4. The joint was opened surgically via the anterior approach, and synovectomy was performed.

The synovia exhibited fibrosis and was hyperplastic. The marginal part of the joint surface had been invaded by pannus and small part of fragmentation was seen, although most of the cartilage was shaped normally. Tuberculosis was not diagnosed on histopathological examination of the resected

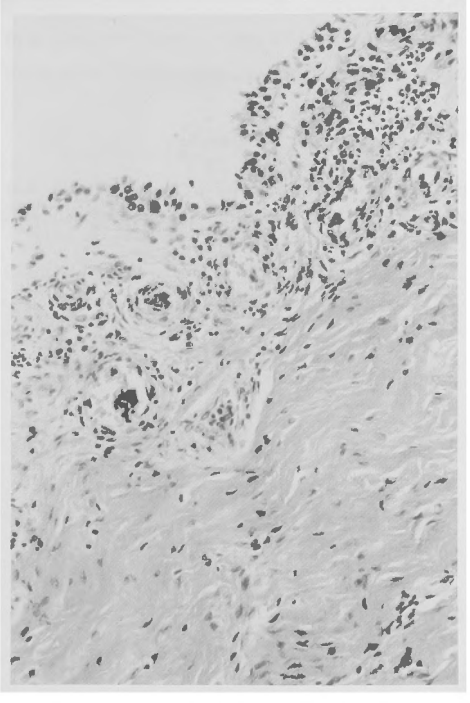

Fig. 4. Histological picture of the synovia of the knee joint
Histological examination of the synovia revealed non specific synovitis with diffuse fibrosis. No caseous necrosis nor epithelioid tissues was recognised.

synovia. In fact, no caseous necrosis nor epithelioid cells were recognised and, therefore, non-specific synovitis with diffused fibrosis was diagnosed (Fig. 4). Thereafter, the prognosis was good and today, four years later, pain and swelling of the joint are not detectable and the range of motion is from 0° to 140°

Discussion

Very few papers have appeared with regard to tuberculosis of the popliteal cyst. Iacono (1976) reported a case with severe joint destruction in which he identified granulomatous infection of the cyst.

Tuberculous arthritis of the knee can be categorized into a synovial type and bone type, with the former being predominant. In many cases, the popliteal cyst communicates with the knee joint. However, if the route of infection in our case was from the infected knee joint to the popliteal cyst via the synovial membrane skin tuberculosis would have developed concomitantly via spread through local capillaries. However, no sign of tuberculosis was found on pathological examination of the synovia. Since synovectomy was performed after the start of antituberculosis drug therapy, there is some question as to whether the infection had cleared up. However, histologically, the arrangement of the synovial cells was well-ordered and there was no disturbance of the collagen fibers in the basal area. Thus it was felt that there had been no infection with tuberculosis. There are two possible routes of tuberculosis infection in our case. The first is infection into the popliteal cyst via knee joint. This is unlikely because the only manifestation of tuberculosis occurred in the popliteal cyst and not in the knee joint. The second route is infection into the popliteal cyst directly from the blood vessels. Either way, a tuberculous lesion was not seen in the knee joint, and so this case appears to be a very rare instance of tuberculosis primarily manifested in a popliteal cyst.

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和文抄録

膝窩嚢腫に発生した結核の一例

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膝窩嚢腫に単独に結核が発症するのは極めて希である．

我々は76歳男性の左膝膝窩嚢腫の結核を経験した．患者は約10ヵ月間の左膝窩部痛に対する治療を受けた後，歩行障害が強くなり当科を受診した．左膝に膝窩嚢腫が存在し，この部を中心に腫脹，発赤，局所熱感等の炎症所見が認められたために，嚢腫切除を含めた病巣廓清術をおこなった．その後同側膝外側部皮下に膿瘍形成を生じたので皮膚部の病巣廓清術を追加した．病理組織学的に嚢腫及び皮膚共に結核性病変が認められた．

その後4ヵ月後に皮下膿瘍が再発した．これは，膝関節に滑膜型結核が存在して，膝窩嚢腫の結核，更に皮膚結核に波及したと推察して，再発皮下膿瘍の病巣廓清と同時に膝関節滑膜切除術をおこなった．しかし予想に反して，滑膜の病理組織には結核の所見は認められなかった．

これらの経過及び病理所見より，本症例は膝窩嚢腫に単独に結核が発症したもので，極めて希な症例である．